



King Saud University
College of Computer and Information Sciences
Department of Computer Engineering

CEN 214 – LOGIC DESIGN 1 3(3, 0, 1)

Semester I, Academic Year 2014-2015

Required Course: Time (M W 8:00-10:00 / M W 10:00-12:00)

Course Description (catalog):

This course provides students with basic knowledge on synchronous sequential machines. Topics include: Memory elements, Sequential circuits analysis, Sequential circuits design, Registers and Counters, Memory and Programmable Logic Devices, Register Transfers and Datapaths, Sequencing and Control.

Prerequisites: - Courses CEN 200

- Topics

- Combinational Logic Design

Textbook(s) and/or Other Required Materials:

Primary: *M. Morris Mano and Charles R. Kime, Logic and Computer Design Fundamentals, 4th Ed, 2007, Prentice Hall*

Supplementary:

Morris Mano, *Digital Design*, 3rd Ed, 2000, Prentice Hall

Course Learning Outcomes: This course requires the student to demonstrate the following:

1. Design and describe the operation of basic memory elements.
2. Analyze the behavior of synchronous and asynchronous machines.
3. Design synchronous and asynchronous sequential machine.
4. Describe and implement finite state machines (FSM).
5. Apply the concepts of basic timing issues, including clocking, timing constraints, and propagation delays during the design process.
6. Use Memory and Programmable Logic Devices.
7. Use basic combinational and sequential components in typical datapath designs.

Major Topics covered and schedule in weeks:

Memory elements	2
Sequential circuits analysis and Design	2
Registers and Counters	2
Memory and Programmable Logic Devices	2
Register Transfers and Datapaths	2
Sequencing and Control	2
Asynchronous Circuit Analysis and Design	2
Review and evaluation	2

Assessment Plan for the Course:

Student's performance in homework, quizzes, exams, and class-projects

Contribution of Course to Meeting Professional Component:

Curriculum Discipline	Percentage
Mathematics and Basic Science	10%
Engineering Science	
Engineering Design	90%
General Education	

Relationship of Course to Program Outcomes

Outcome	Outcome Description	Level of Contribution
(a)	An ability to apply knowledge of mathematics, science, and engineering	✓
(b)	An ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	✓
(d)	An ability to function on multidisciplinary teams	
(e)	An ability to identify, formulate, and solve engineering problems	✓
(f)	An understanding of professional and ethical responsibility	
(g)	An ability to communicate effectively	
(h)	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	A recognition of the need for, and an ability to engage in life-long learning	
(j)	A knowledge of contemporary issues	
(k)	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	✓

Evaluation:

Homework Assignments	10%
Midterm Examination- 1 (6/1/1435H)	25%
Midterm Examination-2 (4/2/1435H)	25%
Final Examination	40%
Total	100%

Course Policies:

- **No late** homework will be accepted.
- The quizzes may be pop or announced, and may be given at anytime during class-time
- Homework assignments are considered individual efforts. However, students are encouraged to share thoughts with others. **ABSOLUTELY NO COPYING**. Academic dishonesty cases will be dealt with severely.
- All exams are closed book.
- The final exam will be comprehensive.

Relationship of course to program objectives:

1. Provide robust understanding of the fundamental areas of computer engineering.
2. Succeed in lifelong learning programs to remain current professionals contributing to the advancement of the global industry.
3. Build strong ethical and behavior system that will assist graduates to face real-life professional and general challenges.

Current Instructor, Department, Office Hours and Date:

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Semester II, AY 2013-2014